Midnite Mine 2018 Remedial Action

Summary Report

May 2019

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ACRONYMS AND ABBREVIATIONS

AMP	Adaptive Management Plan
ARAR	Applicable or Relevant and Appropriate Requirements
BODR	Basis of Design Report
BMP	Best Management Practice
CD	Consent Decree
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CQC/CQA	Construction Quality Control/Construction Quality Assurance
CSWPPP	Construction Stormwater Pollution Prevention Plan
CSZ SDTS	Construction Support Zone Structure Demolition Temporary Stockpile
DCAQMP	Dust Control and Air Quality Monitoring Plan
DCN	Design Clarification Notice
DMC	Dawn Mining Company
EAR	East Access Road
ECN	Engineering Change Notice
EPA	United States Environmental Protection Agency
HDPE	high-density polyethylene
HDS	Horizontal Dewatering System
HSWRP	Hillside Waste Rock Pile
NCP	National Contingency Plan
NCSZ	Northern Construction Support Zone
NNC	Notice of Non-Compliance
RAO	Remedial Action Objective
RAWP	Remedial Action Work Plan
RD/RA	Remedial Design/Remedial Action
RFI	requests for information
ROD	Record of Decision
RO	Reverse Osmosis
Site	Midnite Mine Superfund Site
SPCC	Spill Prevention, Control and Countermeasures
Stockpile 6	Ore and Protore Stockpile #6
Stockpile 7	Ore Stockpile #7
SWMP	Stormwater Management Plan
SWRP	South Waste Rock Pile
TISS	Temporary Impacted Soil Stockpile
TSP	Total Suspended Particulate

ACRONYMS AND ABBREVIATIONS (continued)

UDS	Underdrain Sump
WAC	Washington Administrative Code
WAR	West Access Road
WCA	Waste Containment Area
WRDS	Waste Rock Dewatering Sump

1.0 INTRODUCTION

This *2018 Midnite Mine Remedial Action Summary Report* (*2018 RA Summary Report*) has been prepared on behalf of Dawn Mining Company (DMC) and Newmont USA Limited (DMC/Newmont) to summarize the 2018 remedial action (construction) activities performed at the Midnite Mine Superfund Site (Site). 2018 construction activities began on April 4, 2018 and continued through November 2, 2018 at which time the remedial activities were suspended and winter maintenance activities began.

The work at the Site is being performed under the direction and oversight of the EPA, pursuant to the following regulations and key Site management documents:

- Section 104(a)(1) of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, 42 U.S.C. § 9601 et seq., and Section 300.415 of the National Contingency Plan (NCP), 40 C.F.R. § 300.415.
- The Midnite Mine Superfund Site Record of Decision (ROD; EPA, 2006).
- The Remedial Design/Remedial Action (RD/RA) Consent Decree (CD) lodged by the United States District Court on 17 January 2012, No. CV-05-020-JLQ.

The Remedial Action (RA) work is performed in accordance with the Selected Remedy as presented in the *Midnite Mine Superfund Site 100 Percent Design – Basis of Design Report – Revised October 2015* (*100% BODR*; MWH, 2015), and the *Final Remedial Action Work Plan – Rev 5, April 2018* (*RAWP*, Stantec & WME, 2018). The RA follows the design plans, drawings, and specifications attached to these documents, and revisions to these documents as approved by EPA during construction activities.

The Remedial Action Objectives (RAOs) for each of the contaminated media at the Site are provided in the *RAWP*. These affected media are: surface materials and sediments, surface water, groundwater and air. The Selected Remedy for these media is protective of human health and the environment.

1.1 REPORT OBJECTIVES

This *2018 RA Summary Report* is intended to meet the reporting requirements for an annual RA report and the annual adaptive management reporting as required in the *RAWP*. This report includes descriptions of the 2018 RA work elements and construction progress and also the adaptive management evaluations and recommendations based on this year's work.

Construction quality control and construction quality assurance (CQC/CQA) inspections and observations were performed daily at the Site when RA work was occurring and is documented in daily CQC/CQA reports and weekly construction reports that were provided to the EPA during the field season. Because these reports provide written and photographic documentation of pertinent work activities for any given day during the 2018 RA, they are referenced throughout this report. These daily and weekly reports (including photographs), and the other inspection,

testing and monitoring results are maintained on the Midnite Mine SharePoint site (https://amcollab.mwhtools.com/sites/midnitemine).

Routine CQC/CQA activities included:

- Management of the on-Site airborne total suspended particulate (TSP) monitoring program, as discussed in Section 2.0
- Issuance of Engineering Change Notices (ECNs) as documented in daily and weekly reports which were provided to the EPA. A log of project ECNs issued in 2018 are included in Attachment 1. Final (approved) ECNs are saved on the Midnite Mine SharePoint site.
- Review and approval of contractor submittals and requests for information (RFIs). The project submittal register through the end of the 2018 construction season is in Attachment 2. Final (approved) submittals are saved on the Midnite Mine SharePoint site.

1.2 PROJECT ORGANIZATION

A figure showing the overall organizational structure and key personnel for the Site is provided in Figure 1-9 of the current revision of the RAWP (Stantec & WME, 2018).

1.3 WORK PLANS AND TECHNICAL MEMORANDA

The following task-specific work plans were submitted to and approved by the EPA in 2018, except where noted below.

- *Pit 4 – Post Winter Rockfall Inspection Report* (Hi-Tech Rockfall Systems, 2018). March 27, 2018
- *Pit 4 Underdrain Material Placement and Waste Rock Dewatering System Installation Work Plan* (Stantec, 2018a). April 9, 2018
- *Pit 4 Backfill and Dewatering Riser Installation Plan* (Stantec, 2018b). April 9, 2018
- *Midnite Mine – Pit 4 Transformer Evaluation* (Impact Demolition, 2018a). April 10, 2018
- *Construction Water Management Plan, Revision 4* (Stantec, 2018c). April 17, 2018
- *Remedial Action Work Plan, Revision 5* (Stantec & WME, 2018). May 25, 2018. Note that individual sections of the RAWP were reviewed and approved by EPA between February and May 2018.
- *Hazardous Materials Evaluation and Disposal Related to Building Demolition and Trash Pits in the Construction Support Zone, Midnite Mine Superfund Site* (Impact Demolition, 2018b). May 25, 2018
- *Placement of Low Activity/Low Reactivity Material Against Wall of Pit 4* (Stantec, 2018e). July 26, 2018 was submitted to EPA, no comments received.

These task-specific work plans and memos describe procedures for work performed in 2018 and the specified feature of this work as required by the RAWP. A copy of the approved work plans and memos are maintained on the Midnite Mine SharePoint site.

2018 RA Construction Activities

A Gantt chart of RA construction activities performed during 2018 is provided in Attachment 3. These activities are listed below and discussed in greater detail in Section 2.0:

- Improvements to existing Site access controls and administrative and decontamination facilities.
- Modifications and improvements to on-Site access roads
- Placement of underdrain drainage materials in Pit 4, installation of Pit 4 subwaste liner system, and installation of the Pit 4 Waste Rock Dewatering Sump and horizontal dewatering system.
- Backfill of Pit 4 and ongoing installation of the vertical dewatering systems.
- Abandonment of monitoring wells in accordance with Washington Administrative Code (WAC) requirements.
- Implementation of a 2018 Construction Stormwater Pollution Prevention Plan (CSWPPP) that included installation and maintenance of best management practice (BMP) controls and features.
- Construction of East Infiltration Collector
- Timber removal around Pit 4 and in the southern Construction Support Zone

A more detailed explanation of the 2018 activities listed above is provided in Section 2.0.

1.4 COMPLIANCE WITH APPLICABLE REGULATIONS, RULES, AND PROCEDURES

Remedial action and associated studies at the Site are governed by the requirements of CERCLA and therefore, no federal, state, or local permits are required for this work, as allowed under 42 U.S.C. 9621(e)(1). However, the substantive requirements associated with the permits still must be met. These permitting requirements and applicable codes or guidelines are briefly discussed in the relevant sections of this document. All activities complied with potential applicable or relevant and appropriate requirements (ARARs) for on-Site activities to the extent practicable. These requirements are documented in the *RAWP* and its appendices.

2.0 2018 COMPLETED AND ONGOING CONSTRUCTION ELEMENTS

The 2018 RA construction activities were performed according to the *RAWP* and other work plans and technical memoranda as presented in Section 1.0. Prior to mobilization onto the active portion of the Site (the work areas), a visual inspection was performed on each piece of equipment to make sure invasive weeds or visible contamination was not present on the equipment. These inspections are documented in the daily CQC/CQA reports. At each work area (i.e., area where RA was performed), clearing and grubbing was performed as required to allow for access and the scheduled work. Cleared materials were stockpiled in approved locations as documented in the CQC/CQA reports.

The major construction elements that were completed in 2018 or are ongoing are summarized in the bulleted list in Section 1.4 above and are further described in the following sections. The work areas associated with these construction activities are depicted in Figure 1.

2.1 CONSTRUCTION-RELATED MONITORING AND ENVIRONMENTAL ACTIVITIES

Site Air Monitoring. Air monitoring was conducted throughout 2018 in accordance with the *Dust Control and Air Quality Monitoring Plan* (*DCAQMP*, Appendix B of the *RAWP*, Stantec & WME, 2018). Air monitoring activities during the 2018 construction season consisted of operating stationary and roving dust monitoring equipment by CQC personnel. These activities were documented in the weekly reports that were provided to the EPA and in the quarterly Site air monitoring reports that were prepared by Bison Engineering (Bison 2018a, 2018b, 2018c, 2019) and submitted to EPA in accordance with the DCAQMP. These reports summarize each total suspended particulate (dust) exceedance resulting from an "environmental condition" such as rain, snow, fog, and smoke in addition to exceedances associated with the crushing or other RA construction activities that were occurring. When dust exceedances occur within work areas, mitigation measures are implemented to suppress dust levels from exceeding standards at the project boundary. No dust exceedances were recorded at the project boundary during the 2018 construction season.

Site water was applied to work areas to suppress dust emissions on an as-needed basis. Water from the Site water treatment plant was used in impacted areas and secondary Reverse Osmosis (RO) treated water from the water treatment plant was used in offsite, uncontaminated areas.

Site Stormwater and Spill Control. Construction stormwater controls and spill prevention, control and countermeasures followed plans (i.e., in Appendices D and O) and specifications (i.e., in Appendix K) attached to the *RAWP.* These monitoring results and observations, in addition to information related to Site health and safety, contractor RFIs and submittals are documented in the daily/weekly CQC/CQA reports and are available on the Midnite Mine SharePoint site.

The *Master Stormwater Management Plan* (*SWMP*) and the *Construction Stormwater Pollution Prevent Plan* (*CSWPPP*) in Appendix O were updated for the 2018 construction season to identify BMPs that would be implemented in construction areas during the 2018 field season. In 2018, there were no stormwater releases from areas disturbed by RA construction within the mine affected area prior to completion of cleanup including approval of the Final Status Survey. Stormwater runoff from these areas was captured and conveyed to Pit 3 for treatment. There also were no releases of stormwater to streams from the area where the New Access Road was under construction outside of the mine-affected area or from the North Construction Support Zone (NCSZ) or West Access Road (WAR).

Two spills of petroleum products exceeding the two-gallon reportable limit occurred during the 2018 construction season. Both spills occurred on mine waste materials inside the exclusion zone. Materials from the cleanup of these spills were placed in Pit 4 in the Demolition Debris Placement Zone as described in Appendix H and delineated in Section 8 of the Design Drawings included in the 100% BODR (MWH, 2015). These Spill Prevention, Control and Countermeasures (SPCC) Incidents, and their associated cleanup, were documented in Spill Incident Reports, Daily CQC/CQA Reports, and the Spill Incident Log, all of which are posted on the Midnite Mine SharePoint site.

Nesting Bird Surveys. Nesting bird surveys were performed of construction areas prior to removal of trees during the nesting bird season which extends from March through July at the Site. Surveys were performed on April 24th, June 11th, June 29th, and July 16th. Summaries of the results of those surveys are posted on the Midnite Mine SharePoint site.

2.2 COMPLETED REMEDIAL ACTIVITIES

Remedial activities completed during the 2018 construction season are listed below and discussed in the following sections.

- Pit 4 Underdrain Sump System
- Pit 4 Sub-Waste Liner System
- Pit 4 Waste Rock Dewatering System
- Excavation of Ore and Protore Stockpile #6 and Ore Stockpile #7.

2.2.1 Pit 4 Completed Activities

The following activities associated with the Pit 4 Underdrain and Waste Rock Dewatering Systems were completed during 2018 in accordance with the *Pit 4 Underdrain Material Placement and Waste Rock Dewatering System Installation Work Plan* (Stantec, 2018a) and the *Pit 4 Backfill and Dewatering Riser Installation Plan* (Stantec, 2018b).

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Pit 4 Underdrain Sump System

Placement of Drain Rock and Drain Gravel for the Pit 4 Underdrain System occurred in 2017 as described in the *Midnite Mine 2017 Remedial Action Summary Report* (*2017 Summary Report*) (Stantec, 2018d). Grading of Drain Gravel to its final design elevations began on April 4th. A small amount of additional Drain Gravel was hauled into the pit from the stockpile in Area 5 to achieve the final design elevations (i.e., the top of Drain Gravel surface). Submittal of top of Drain Gravel survey data was divided into two parts, there was one submittal for the north half of the pit and a second for the south half. Two submittals were necessary to allow concurrent placement of Liner Bedding Material while maintaining access around the WRDS. Final grading of the Drain Gravel in the north half of the pit was completed on April 9th and in the south half of the pit, it was completed on April 20th as documented in submittals 01018-19 and 01018-20, respectively.

Once final grading of the Drain Gravel layer was completed and approved, Liner Bedding Material was placed over the drain gravel as depicted on sheet 4-81 of the Design Drawings included in the 100 % BODR (MWH, 2015). Installation of this material began in the north half of Pit 4 on April 10th. Liner Bedding Material was produced and stockpiled in Area 5 as part of the 2017 crushing and screening operation as described in the *2017 Summary Report* (Stantec, 2018d). Material was hauled from the stockpile in Area 5 and placed in a one-foot thick lift over the Drain Gravel. Similar to the Drain Gravel, the Liner Bedding Material final surface was accepted in two submittals, one for the north and one for the south halves of the pit. Placement of Liner Bedding Material in the north half of the pit was completed on April 27th and is documented in Submittal 01018-21. Placement of Liner Bedding Material in the south half of the pit was completed on May 3rd and is documented in Submittal 01018-22.

Pit 4 Sub-Waste Liner System

The Sub-Waste Liner System consists of three layers of geosynthetic materials (1)a lower geotextile cushion layer placed over the Liner Bedding Layer, an HDPE geomembrane, and an upper geotextile cushion layer. Following placement of the Liner Bedding Material, the anchor trench for the geosynthetic layers was excavated. The anchor trench in the rockfall protection berm as shown in Detail 11 on sheet 4-81 of the BODR drawings was a two-foot-wide by two-and-a-half-foot deep trench excavated in the center of the rockfall protection berm. This approved design detail was not constructible in the top width of the rockfall protection berm due to the angle of repose of the Drain Gravel and Liner Bedding Material (i.e., the angle the placed material naturally falls to). The revised anchor trench is documented in RFI 2018-001. The anchor trench was excavated between April 26th and May 1st.

Comanco, the liner installation contractor, began installing the Pit 4 Sub-Waste Liner System on May 1st. Properties of the geotextile and geomembrane materials are documented in Submittals 02272-03 and 02274-05. Placement of the lower geotextile cushion, geomembrane and upper geotextile cushion proceeded concurrently starting at the north end of the pit and working to the south. As approved in RFI 2018-002, geotextile panels were overlapped six-inches and the seams were heat bonded together. The geosynthetic layers of the Sub-Waste Liner System temporarily were anchored in place using sandbags during installation.

During installation of the geosynthetic layers, CQC was performed by Comanco. CQC/CQA staff verified that all required inspections and testing were performed, verified that inspection and testing results conformed with the project specifications, inspected all seams and patches prior to placement of overlying layers, and observed installation procedures including performance of inspection and testing activities.

Details of the CQC/CQA activities are included in the daily and weekly CQC/CQA reports. Results of CQC testing performed by Comanco are included in Submittal 02272-05. Placement of the geosynthetic layers was completed on May 12th.

Placement of the Overliner Protection Layer began on May 14th (refer to Detail 10 on sheet 4-81 of the Design Drawings in the 100% BODR). Processed earthen material for the Overliner Protection Layer was produced and stockpiled during crushing and screening operations in 2017. Two gradation tests were performed on the stockpiled Overliner Protection Layer material in 2017 and an additional six gradation tests were performed in 2018. Results of the gradation tests are provided in Submittal 02205-16 and demonstrate that the material conforms with the requirements of the Section 02205 of the Specifications included as Appendix K of the RAWP (Stantec & WME, 2018).

The Overliner Protection Layer was placed over the geosynthetic layers working from the south end of the liner to the north to avoid heavy equipment traffic directly over the geosynthetics. The material was placed in a lift greater than three-foot-thick using a low ground pressure bulldozer. Once a layer of overliner protection material greater than three-foot-thick was established, haul trucks were allowed to travel over the liner on the Overliner Protection Layer. CQC/CQA personnel visually verified that Overliner Protection Layer was not dumped directly on the liner, but dumped outside the limits of the liner or on Overliner Protection material that had already been placed to thickness of not less than 3-feet. In general, the Overliner Protection Layer was placed from the center of the pit working towards the edges. This pushed wrinkles that formed in the geomembrane toward the edges of the Subwaste Liner. When required, an excavator was used to place Overliner Protection Layer material directly on wrinkles to remove them.

On May 16th, during placement of the Overliner Protection Material a seam in the upper geotextile cushion layer failed in the vicinity of the WRDS and a portion of the Overliner Protection Layer and the upper geotextile cushion layer slid along the interface with the HDPE geomembrane into the WRDS (Refer to CQC daily report from May 16th that shows photographs of this incident). Material that slid into the WRDS was removed using low ground pressure equipment and hand labor. Following removal of the material from the WRDS, the geomembrane was inspected by Comanco on May 21st. Repairs to the geomembrane and replacement of the upper geotextile cushion was successfully completed on May 23rd. Data for CQC testing of the repairs are included in Submittal 02272-05.

Following completion of the liner repairs, construction methods were modified for placing the Overliner Protection Layer in the WRDS. The anchor trenches to the east and west of the WRDS were filled with Overliner Protection Layer material, then a ramp was constructed into the bottom of the WRDS using remaining Liner Bedding Material which also meets the Overliner

Protection Layer gradation specifications. A low ground pressure Caterpillar 305 excavator was used to place Liner Bedding Material on the bottom and side slopes of the WRDS in an uphill direction from the bottom of the sump (as opposed to the original downhill placement direction). When the available Liner Bedding Material stockpile was exhausted, a layer of filter geotextile was placed along the top edge of the Liner Bedding Material and the remainder of the WRDS side slopes were covered with Overliner Protection Layer material. A long reach excavator then was used to feed Overliner Protection Layer material to the excavator working in the sump so that only low ground pressure equipment was working within three vertical feet of the geomembrane. In addition, the drop height of material placed from the excavator on the liner was restricted to less than two feet. Placement of the Overliner Protection Layer and Drain Gravel within the WRDS occurred concurrently to avoid unnecessary shear stresses on the relatively steep WRDS slopes, as discussed in greater detail below, thereby minimizing the potential for instability of the Overliner Protection Layer as was experience during initial construction.

On June 1st, after placement of Pit 4 Overliner Protection Layer in the WRDS was completed, placement of Overliner Protection Layer began to the north of the Pit using the same methods that were used prior to reaching the WRDS. Placement of Overliner Protection Layer was completed on June 8th. Survey documentation of the final Overliner Protection Layer surface and verification that minimum thickness requirements were met are included in Submittal 01018-24.

Pit 4 Waste Rock Dewatering Sump

The Waste Rock Dewatering Sump is located in the low point of the underdrain surface (refer to Sheet 2017-02-03 of ECN 2017-02) and is meant to capture meteoric water that infiltrates through the mine waste backfill during construction prior to reaching the underdrain system. The water captured in the WRDS is then pumped to the water treatment plant for treatment. The purpose of the subwaste liner and WRDS is to separate water that infiltrates through Pit 4 backfill materials (possibly containing sediments) from groundwater that flows into the underdrain sump.

Placement of the drain layers within the WRDS occurred in horizontal lifts simultaneously with the placement of Overliner Protection Layer in the sump (refer to Sheet 3) to avoid stressing the underlying geosynthetic interface layers as happened during initial placement of the Overliner Protection Layer in the WRDS. The WRDS construction included setting the base sections of the WRDS Vertical Dewatering Risers on top of the overliner protection layer, installing the Horizontal Dewatering System (HDS) pumps, backfilling the sump with Drain Gravel, and placing Intermediate Filter Sand and Filter Sand layers over the top of the Drain Gravel. WRDS as-built conditions are documented in Submittal 01018-25 and 01018-26. Refer to the attached Sheets 2 and 3 for a plan and cross-sectional view of these construction elements.

- Geotextile filter material was placed between Overliner Protection Layer material and Drain Gravel in the sump. Geotextile seams were overlapped with overlap lengths verified by CQC/CQA prior to placement of overlying layers.

- The base section of the WRDS Vertical Dewatering Risers (i.e., perforated stainless steel casings, 10-inches in diameter and 10-feet long) were set on May 30. Two level pads were constructed on the top of the Overliner Protection Layer in the bottom of the sump. The perforated, stainless steel riser base sections (see Submittal 02205-07) were placed on the leveled pads and carpenter levels were used to verify that the base sections were vertical. The base sections were wrapped with two wraps of geonet before placement of Drain Gravel around the risers began. Once Drain Gravel was placed to within approximately two feet of the top of the base section, the center of the top of riser was surveyed with GPS survey equipment for verification of verticality of subsequent riser sections as discussed in Section 2.3.5.
- Two HDS dewatering pumps were installed near the bottom of the WRDS. Submittal 01018-26 shows the as-built alignments of the pumps and pipelines. The pipelines run from each pump to the HDS Vault in Area 5 where pumped water will combine with flows from the Underdrain Sump (UDS) HDS pumps and flow in a single pipeline to Pit 3, see Section **Error! Reference source not found.** for additional information on the HDS Vault to Pit 3 pipeline. The alignment of the WRDS HDS pipelines are shown on Sheet 2.
- Drain Gravel was placed in the WRDS to an elevation of 3010 ft per RFI 2018-004. Intermediate Filter Sand and Filter Sand were placed over the Drain Gravel. Both materials were imported from the gravel quarry in Wilbur, WA. Gradation data for the Intermediate Filter Sand was provided in Submittal 02205-10 and for the Filter Sand in Submittal 02205-15.

  Intermediate Filter Sand was placed over the WRDS drain gravel surface in a 1.5 ft thick lift. Within 5 feet of the vertical risers, this material was placed using an excavator in lifts not greater than 1 foot in thickness. Filter Sand was placed over the Intermediate Filter Sand in a 1.5-foot-thick lift. Again, within 5 feet of the risers, the Filter Sand was placed with an excavator in lifts not greater than 1 foot in thickness.

  Water was applied from a water truck following placement of each lift of the Filter Sand then the material was compacted with a jumping jack and nuclear density tests were performed prior to placing the next lift. Results of the density tests are provided in Submittal 02205-18 and these tests showed that densities exceeded the minimum required though moisture contents consistently were outside allowable tolerances. Acceptance of the high moisture content during compaction is documented in RFI 2018-007.

2.2.2 Mine Waste Excavation

Ore and Protore Stockpile 6 (Stockpile 6) and Ore Stockpile 7 (Stockpile 7), which are categorized as high activity/high reactivity material in the RAWP, were fully excavated during the 2018 construction season. Excavation of these two stockpiles and their placement in the Pit 4 Waste Containment Area were performed in accordance with the *Pit 4 Backfill and Dewatering*

Riser Installation Plan (Stantec, 2018b)and the *Placement of low activity/low reactivity material against wall of Pit 4* plan (Stantec, 2018e).

These stockpiles were excavated to below the base of excavation topography shown in the BODR. This base topography for the stockpiles was developed from premine topography and drilling data. Both stockpiles are located on top of low activity/low reactivity mine waste materials of the South Waste Rock Pile (SWRP) which are visually indistinguishable from the Stockpile 6 and Stockpile 7 material. Final Status Surveys were not performed after removal of Stockpiles 6 and 7 because of the additional mine wastes that will have to be excavated and placed in Pit 4 or 3 in order to reach the native ground surface.

Excavated material from these stockpiles was hauled to Pit 4 and placed in the designated zone for high activity/high reactivity materials [i.e. a minimum of 20 feet from the edges of the Pit 4 Waste Containment Area (WCA)].

Stockpile 6 materials included Pit 4 bottom sediments that were placed on this stockpile in 2017, as well as additional materials placed on top of the stockpile during previous construction seasons. Debris that had been placed on the Stockpile 6 was disposed of in Pit 4 along with the Demolition Debris as discussed in Section 2.3.5.

Stockpile 7 was originally planned to be relocated prior to the crushing and screening operations. However, instead of relocating the stockpile, reject material from the crushing and screening operation was placed on portions of this stockpile during the 2017 construction season. In the *Hillside Waste Rock Pile – Pit 4 Rock Crushing& Stockpiling Plan* (Envirocon, 2017), a 5-foot horizontal buffer zone beyond the toe was delineated in areas where crusher reject material was placed against the stockpile. Reject material within this 5-foot horizontal buffer zone was assumed to be high activity/reactivity waste excavated as part of Stockpile 7 and placed in high activity/high reactivity placement zone within Pit 4.

Post excavation survey data for Stockpile 6 was included in Submittal 01018-28 and for Stockpile 7 was included in Submittal 01018-27.

2.3 ONGOING CONSTRUCTION ACTIVITIES

The following sections present construction activities that remain in progress at the end of the 2018 construction season.

2.3.1 East Access Road Maintenance and Improvements

During implementation of the Site Remedy, the East Access Road (EAR) accommodates heavy construction equipment access, daily worker and supply vehicle traffic, etc. Because this road is the primary access route to the Site, it requires regular maintenance and some improvements to meet construction safety standards and to handle the high volume of construction traffic, as well as continue to serve the needs of the Mine Water Treatment Plant. Routine maintenance included grading, the application of lignosulfonate and dust suppression water as needed, and snow removal and sanding when required.

Grading of the EAR roadway was performed on an as-needed basis. Crushed aggregate surface course material imported from the previously-approved Copenhaver quarry in Wilbur, Washington was used to fill potholes within the EAR as part of the grading work and for sanding of the roadway when icy conditions existed. Approval for use of the imported crushed aggregate surface course is documented in Submittal 02200-01. Safety barriers and signage that were installed along portions of the EAR in 2017 were maintained. Limited trimming of vegetation was performed to improve unobstructed site distances in select areas.

2.3.2 Temporary Administrative Support Area

The temporary administrative support area is located on the east side of the Site, northwest of the East Access Gate, on the southern portion of the East Waste Rock Pile (see Figure 1 and Design Drawing 1-7). In 2018, a mobile facility with a change room and meeting room was installed and the parking area was expanded to the east. A four-inch thick layer of imported crushed aggregate surface course, from the Copenhaver quarry in Wilbur, Washington quarry was used as plating over the surface of the East Waste Rock Pile where the parking area was expanded.

The old laydown yard, located on the northwest corner of the East Waste Rock Pile, was expanded to establish a Helispot. Vegetation removed to establish the Helispot was placed in the existing timber stockpile in the exclusion zone. The area was graded and covered with crushed aggregate surface course from the Copenhaver quarry in Wilbur, Washington.

2.3.3 Existing Site Access and Temporary Decontamination Facility Maintenance and improvements

The existing temporary decontamination facility, located northwest of the East Waste Rock Pile, was improved in 2018 to support RA Site activities. Improvements to the existing decontamination facility include the following:

- Installation of a concrete wash pad at the decontamination facility.
- Maintenance of control zone demarcation (control zone rope and warning signs) at the Site (i.e., at the East Access Road, the West Access Road, and the New Access Road).

Personnel and equipment decontamination procedures are further described in the *Radiation Protection Plan* (Appendix L of the *RAWP*).

2.3.4 On-Site Access Road Improvements and Maintenance

On-Site access road maintenance was performed on an as-needed basis in 2018 and included grading of the roadways, maintenance of stormwater controls such as water bars and road side ditches, and placement of surfacing material. Surfacing materials for on-Site roads were sourced from the off-spec and reject materials from the 2017 Hillside Waste Rock Pile (HSWRP) crushing and screening operation.

A light vehicle road was constructed from the northeast edge of Stockpile 8 to Area 5 through the Backfilled Pits area along the west crest of Pit 3. The light vehicle road established separation between light vehicles and heavy equipment traveling to Area 5 and Pit 4.

2.3.5 Pit 4 Backfill

Mine Waste Excavation and Placement

Mine waste materials from the:

- Crusher Reject Material Stockpile,
- Temporary Impacted Soil Stockpile (TISS),
- Ore Stockpile #3, Protore Stockpile #4,
- Ore and Protore Stockpile #5,
- Lime Protore Stockpile #8, and
- the South Waste Rock Pile

were excavated and hauled to Pit 4. Each of these areas were partially completed in 2018. Excavation of Stockpiles 6 and 7 was completed in 2018 and is discussed in Section 2.2.2.

These mine waste materials were hauled to Pit 4 and were placed in the pit in lifts following the procedures presented in the *Pit 4 Backfill and Dewatering Riser Installation Plan* (Stantec, 2018b) and the technical memorandum *Placement of low activity/low reactivity material against wall of Pit 4* (Stantec, 2018e). Individual lifts were 10 feet or less in thickness. Low activity/low reactivity placement along the pit walls proceeded in advance of the placement of high activity/high reactivity material in the central area of the pit.

Each lift was constructed in 2 stages; 1) material was transported to the north end of Pit 4 and dumped thereby filling the pit incrementally from the north end to the south end of the pit, 2) once material reached the southern end of the pit, additional material was placed over the plug dumps and was bulldozed from the south to north thereby leveling the top lift surface. Lift thickness was maintained and controlled using GPS machine control equipment mounted on the bulldozers.

Installation of Vertical Dewatering Risers

Installation of the Vertical Dewatering Risers, initially the two from the Underdrain Sump and later two additional risers from Waste Rock Dewatering Sump, continued as the elevation of fill in Pit 4 increased. Installation of the risers was performed in accordance with the *Pit 4 Backfill and Dewatering Riser Installation Plan* (Stantec, 2018b).

Above the Sub-Waste Liner System (including Overliner Protection Layer) and the WRDS (see Section 2.2.1), friction sleeves were installed around the vertical dewatering risers (refer to Sheet 3) to reduce potential drag-down forces on the risers as the pit backfill settles. The base elevations of the friction sleeves were adjusted, in accordance with RFI 2018-006, so that the top of each friction sleeve section is below the top of each vertical riser section which helps facilitate the installation of the risers. Each section of friction sleeve was wrapped with two layers of 80-mil HDPE geomembrane, the same material used in the Sub-waste Liner System. The geomembrane wrap was secured to the friction sleeve with cable ties.

Once the vertical riser, friction sleeve, and geomembrane wrap were installed, Drain Gravel then was placed around the risers and tamped with an excavator bucket in accordance with RFI 2017-004. During placement of the Drain Gravel around the risers, the center of each section of casing was surveyed to verify verticality over the base of the riser. Survey data of riser verticality was posted to the project SharePoint drive throughout the construction season and was included in Submittal 01018-31 at the end of the construction season. Pit 4 riser verticality data are presented in Table 1 and show that the risers are within 0.1 feet of vertical.

Following placement of fill around the risers and confirmation of the verticality of the riser, bentonite chip was poured into the annular space between the stainless-steel riser and the friction sleeve. The bentonite chip was hydrated by adding approximately 3-gallons of water to the annular space as the bentonite chip was being added.

A dummy pump fabricated from a 10-foot length of 8-inch DR 11 HDPE with an outside diameter of approximately 9 inches was lowered down each vertical riser following installation of every 3rd 10-foot riser section to verify clear passage for future installation of the dewatering pumps in these risers. At the end of the 2018 construction season, the vertical dewatering risers from the Underdrain Sump had a total depth (or casing length) of 200 feet and the WRDS had a total depth (or casing length) of 160 feet from the top of casing.

Table 1 – Riser Installation Verticality Check Data

Riser Section	Survey Data		Horizontal Deflection (ft)	Riser Section	Survey Data		Horizontal Deflection (ft)
	Northing	Easting			Northing	Easting	
Underdrain Sump, North Riser				**Underdrain Sump, South Riser**			
Base	357900.68	2311789.61	--	Base	357891.06	2311787.08	--
1	357900.73	2311789.62	0.04 NE	1	357891.07	2311787.07	0.01 NW
2	357900.71	2311789.60	0.02 NW	2	357891.06	2311787.09	0.01 SE
3	357900.69	2311789.62	0.01 NE	3	357891.06	2311787.08	0.01 NW
4	357900.69	2311789.60	0.01 NW	4	357891.05	2311787.08	0.01 S
5	357900.69	2311789.61	0.01 NE	5	357891.07	2311787.08	0.01 N
6	357900.61	2311789.61	0.07 S	6	357891.04	2311787.13	0.05 SE
7	357900.68	2311789.63	0.02 SE	7	357891.07	2311787.08	0.01 NW
8	357900.68	2311789.61	0.01 SW	8	357891.12	2311787.10	0.06 NE
9	357900.67	2311789.61	0.02 SE	9	357891.06	2311787.13	0.05 SE
10	357900.71	2311789.59	0.03 NW	10	357891.07	2311787.07	0.01 NW
11	357900.69	2311789.62	0.01 NE	11	357891.05	2311787.12	0.04 SE
12	357900.68	2311789.60	0.00 SW	12	357891.06	2311787.08	0.01 SW
13	357900.69	2311789.62	0.01 NE	13	357891.06	2311787.08	0.01 SW
14	357900.71	2311789.62	0.03 NE	14	357891.08	2311787.07	0.02 NW
15	357900.76	2311789.60	0.07 NW	15	357891.11	2311787.08	0.05 NW
16	357900.70	2311789.62	0.02 NE	16	357891.05	2311787.07	0.02 SW

Riser Section	Survey Data		Horizontal Deflection (ft)		Riser Section	Survey Data		Horizontal Deflection (ft)
	Northing	Easting				Northing	Easting	
17	357900.66	2311789.62	0.02 SE		17	357891.03	2311787.09	0.03 SE
18	357900.67	2311789.60	0.01 SW		18	357891.04	2311787.07	0.03 SW
19	357900.68	2311789.56	0.05 SW		19	357891.05	2311787.07	0.02 SW
Base	357900.68	2311789.61	--		Base	357891.06	2311787.08	--
WRDS, North Riser					**WRDS, South Riser**			
Base	357868.31	2311764.57			Base	357857.95	2311762.23	
1	357868.30	2311764.58	--		1	357858.00	2311762.29	--
2	357868.32	2311764.61	0.04 NE		2	357857.97	2311762.30	0.07 NE
3	357868.34	2311764.54	0.04 NW		3	357857.95	2311762.22	0.01 SW
4	357868.31	2311764.56	0.01 NW		4	357857.96	2311762.23	0.01 NE
5	357868.30	2311764.57	0.01 SW		5	357857.95	2311762.24	0.01 E
6	357868.33	2311764.57	0.02 NW		6	357857.95	2311762.21	0.02 SW
7	357868.32	2311764.59	0.02 NE		7	357857.95	2311762.23	0.01 SE
8	357868.32	2311764.57	0.01 NW		8	357857.95	2311762.23	0.01 SE
9	357868.31	2311764.57	0.00 N		9	357857.96	2311762.22	0.00 NW
10	357868.37	2311764.61	0.08 NE		10	357857.99	2311762.26	0.05 NE
11	357868.36	2311764.54	0.06 NW		11	357857.98	2311762.22	0.03 NW
12	357868.33	2311764.58	0.02 NE		12	357857.96	2311762.24	0.02 NE
13	357868.31	2311764.59	0.02 SE		13	357857.96	2311762.24	0.02 NE
14	357868.30	2311764.58	0.02 SE		14	357857.96	2311762.22	0.01 NW
15	357868.34	2311764.55	0.04 NW		15	357857.92	2311762.17	0.06 SW

Demolition Debris Placement

Demolition debris including the debris and structures from the Man Camp and other debris from Site that accumulated prior the start of the RA was stockpiled in the Construction Support Zone Structure Demolition Temporary Stockpile (CSZ SDTS) during the 2016 and 2017 construction seasons. Material in the CSZ SDTS was sized in accordance with the Section 02050 of the project specifications in Appendix K of the RAWP (Stantec & WME, 2018). After sizing, demolition debris was placed in Pit 4 in designated demolition debris disposal areas delineated in Appendix H and Section 8 of the Design Drawings included in the 100% BODR (MWH, 2015). Additionally, 2 sludge trucks and a bulldozer associated with former mine and water treatment operations were demolished, sized, and placed within the designated demolition debris disposal area in Pit 4. The sludge trucks were decontaminated and scanned in accordance with the RPP and determined to have residual radioactivity that precluded off-Site disposal of the equipment. In addition, mine waste materials impacted with petroleum products that were collected during the 2016 through 2018 construction seasons were also placed in demolition debris disposal area in Pit 4.

The debris listed above was placed in accordance with Sections 02050 and 02205 of the specifications, with required separation from the pit walls, vertical dewatering risers and sub-waste liner system. Material was placed in lifts of two feet or less, spread to minimize formation of voids and covered with mine waste material. Lift thicknesses, material distribution, and offsets from Pit walls and vertical dewatering risers were visually verified by CQC/CQA personnel prior to placement of two feet of mine waste material over the debris.

2.3.6 Pit 4 Infiltration Collectors

The Pit 4 Infiltration Collectors are located along the east and west wall of Pit 4 and are intended to intercept and convey water that infiltrates through mine waste during backfilling to the WRDS before it reaches the underdrain system. In 2018, the Pit 4 backfill footprint reached the proposed infiltration collector locations and thus, the infiltration collectors needed to be constructed. The design for these Infiltration Collectors was revised in ECN 2018-2. The design change modified the configuration of the Infiltration Collectors on the west wall of Pit 4 to improve constructability with the added benefit of discharging collected water directly to the HDS Vault at the southern edge of the Pit 4 backfill rather than routing it to the WRDS in the bottom of Pit 4 mine waste backfill, from where it would need to be collected and pumped to the HDS Vault.

Test Pits excavated along the East Infiltration Collector alignment indicated that highly fractured, weak metasedimentary bedrock exists along the eastern edge of Pit 4 and that the depth to competent bedrock (as defined by excavator refusal), which was to form the base of the infiltration collectors, was significantly deeper than anticipated. ECN 2018-2 revised the design of the East Infiltration to consist of a Drain Gravel filled collection trench with a conveyance pipe that conveys collected water to the top of the Subwaste Liner System. The East Infiltration Collector was constructed during the 2018 construction season with as-constructed conditions documented in Submittal 01018-29.

Timber was cleared along the alignments of the West Infiltration Collector system. No further construction of the West Infiltration Collectors occurred during the 2018 construction season.

2.3.7 Influent and Effluent Pipelines

Temporary pipelines are necessary to convey mine impacted water from Pit 4 to Pit 3 during the backfilling operations and cover construction. The initial temporary pipeline, constructed in 2017, ran from the HDS Vault to Pit 3, dropped over the north wall of Pit 3, and the discharged water from Pit 4 flowed down the north wall as shown on sheet 10-3 of the 100% BODR drawings. During 2018, this initial pipeline was extended to follow the design alignment around the east side of Pit 3 as shown on Drawing 10-4 of the *100% BODR* and in accordance with Design Clarification Notice (DCN) 2017-2.

The pipeline was constructed from Dimensional Ration (DR) 11 High-Density Polyethylene (HDPE). Pipe lengths were butt fusion welded together to form two sections. These sections were pressure tested in accordance with Specification 02594 and RFI 2018-010. The alignment was modified slightly to follow the existing road around the edge of Pit 3. The water meter on

the pipeline remained in the same location, between Pit 3 and Area 5. The pipeline over the north wall of Pit 3 was left in place to serve as an emergency discharge point in case the lower pipeline freezes or any other blockage occurs (refer to Sheet 1).

The pipeline runs through a depression on the northeast side of Pit 3. The pipeline was buried through this section for freeze protection, consistent with the response to RFI 2018-012, and an air vent was installed for vacuum relief on the downstream end of the depression where the pipeline returned to a positive gradient towards Pit 3. The remainder of the pipeline was placed on a graded platform that maintained positive gradient towards Pit 3 with soil piles used to anchor the pipeline. The as-constructed alignment of the Pit 4 to Pit 3 pipeline was included in Submittal 01018-32.

2.3.8 Monitoring Well Abandonment

Abandonment of monitoring wells that are identified in *Appendix Z – Well Decommissioning Plan* of the *RAWP* (Stantec & WME, 2018)continued during the 2018 construction season. A total of nineteen (19) additional wells were decommissioned during the 2018 construction season. Per RFI 2018-011, all wells were decommissioned in accordance with Washington Department of Ecology (Ecology) well decommissioning regulations and guidance (where appropriate).

As presented in RFI 2018-005, wells BOM-89-10d and BOM-89-10s were identified as part of the long-term monitoring system in the Well Decommissioning Plan. However, these wells were located at the edge of the haul road to Pit 4 and posed a safety hazard due to the restricted road width at this location. As a result, and after consultation with the EPA, these two wells were decommissioned by Fogle Pump and Supply, Inc (Fogle) on July 27th and 28th with gravity-placed bentonite grout from the bottom of the well up using a tremie tube.

Fogle decommissioned the remaining 17 wells between September 18th and October 18th according to the procedures described in the *Well Decommissioning Plan*.

- Three of the wells were identified as having been constructed in accordance with Ecology requirements and were decommissioned by gravity placement of bentonite from the bottom of the well up using a tremie pipe.
- Well THSS-01 was a 1-inch diameter well that was smaller than the tremie tube. The well was dry so PEL-PLUG, a coated bentonite chip, was used to decommission this well.
- The remaining 14 wells were not constructed to Washington Department of Ecology requirements or construction records could not be located. These wells were decommissioned by perforating with a Holte star perforator, for wells 6-inch diameter or larger, followed by tremie grouting with bentonite grout from the bottom up. Smaller diameter wells were tremie grouted with bentonite grout from the bottom up followed by pulling the casing until the casing was fully removed or broke.

Decommissioning logs for the wells decommissioned in 2018 were included in Submittal 02016-03.

3.0 ADAPTIVE MANAGEMENT PLAN (AMP)

Adaptive management is a dynamic, iterative process by which certain aspects of the RD elements are monitored during the RA construction to provide indications as to whether additional designs or design modifications are necessary during the next phase of work. Adaptive management includes corrective actions that may be necessary on previously constructed remedy elements that aren't functioning properly. If corrective actions are necessary, they will be conducted so that the overall in-place remedy continues to fulfill the remedial action objectives.

Table 5-1 in the *RAWP* (Stantec & WME, 2018) lists the design or operational criteria that were identified as having a moderate likelihood of change and if changes occur, might result in one or more of the following changes:

- Design modifications to guide future construction,
- Reanalysis of construction techniques and equipment,
- Operational modifications (i.e., changes in procedures) to an as-built remedy structure to enhance its performance, and/or
- Repair or rework of a structure built during an earlier phase of the RA.

The design or operational criteria identified in Table 5-1 in the *RAWP* are unique to the Midnite Mine project, but the adaptive management process is integral to any design and construction project where feedback during construction results in design or operational changes. The operational criteria in Table 5-1 were developed in consultation with EPA and the Tribe and represent those items that have a moderate possibility of change as the RD is constructed and so are monitored.

3.1 AMP TRACKING FOR YEAR END 2018

Summaries of key quantities for 2018, and where appropriate, the corresponding design assumptions, are listed in Table 2.

Table 2 – Adaptive Management Plan Quantity Tracking

Item	Description	2018	Cumulative	Assumed	Action
Construction Water	Off-Site (RO treated) water (gallons)	111,900	1,550,400	N/A	Continue Tracking Water Use
	On-Site (Pit 4) water (gallons)	9,556,100	14,819,200	N/A	Continue Tracking Water Use
	Total Construction Water Used (gallons)	9,668,000	19,721,600 (1)	26,888,850 (2)	Continue Tracking Water Use
	Total Lease-Agreement Water Used (gallons)	9,668,000	16,369,600	26,888,850 (2)	Continue Tracking Water Use
Pit 4 Backfill Source Volumes	UDS Drain Rock & Gravel (placed cubic yards [cy])	-660	91,200	95,700	None
	UDS Liner Bedding (placed cy)	5,540	5,540	5,200	None
	Overliner Protection Layer (placed cy)	22,000	22,000	N/A	None
	WRDS Drain Gravel and Filters (placed cy)	2,580	2,580	N/A	None
	Temporary Impacted Soil Stockpile to Pit 4 (bank cy)	114,100	114,100	N/A	None
	Demolition Debris (bank cy)	1,700 (3)	1,700	N/A	None
	Ore Stockpile #3 (bank cy)	16,000	16,000	34,200 (4)	None
	Protore Stockpile #4 (bank cy)	105,900	105,900	379,000 (4)	None
	Ore & Protore Stockpile #5 (bank cy)	70,800	70,800	79,900 (4)	None
	Ore & Protore Stockpile #6 (bank cy)	288,900 (5)	288,900	185,000 (6)	None
	Ore Stockpile #7 (bank cy)	128,000 (7)	128,000	78,600 (6)	None
	Lime Protore Stockpile #8 (bank cy)	423,800	423,800	N/A (4)	None
	South Waste Rock Pile (bank cy)	627,600	627,600	N/A (4)	None
Pit 4 as Placed Volume	Volume of Fill in Pit 4	1,710,400	1,802,300	N/A	None
	Percent Shrink/Swell (8)	-5.6%	-5.3%	0%	Continue Tracking

(1) Includes 3,352,000 gallons water trucked to Site from Springdale in 2016.

(2) Estimated water usage for construction years 1 through 3 presented in Table T-2, Appendix T of the *100% BODR* (MWH, 2015).

(3) Change in volume of the CSZ SDTS between 2017 and 2018. Does not include trucks and dozer that were disposed of in the pit or volume reduction associated with sizing of the material.

(4) Stockpile excavation not completed during the 2018 construction season

(5) Volume includes Pit 4 bottom materials that were stockpiled on Stockpile 6 in 2017.

(6) Stockpile excavation completed during the 2018 construction season

(7) Volume includes crusher reject materials that were handled as part of Stockpile 7 due to the material buffer requirements of the *Hillside Waste Rock Pile – Pit 4 Rock Crushing & Stockpiling Plan* (Envirocon, 2017)

(8) Value is the difference between the sum of the Pit 4 backfill source volumes and the Pit 4 as placed volume divided by the Pit 4 as placed volume. Negative value indicates that as placed material takes up less volume than the source material.

Key interim quantities that currently are being tracked include:

1. **Construction Water Use**. The first item on Page 1 of Table 5-1 in the *RAWP* identifies that: "Water Use during Construction – assumes based on initial evaluations in *Appendix T of the 100% BODR* that there is sufficient water from the WTP to provide the required quantities of potable and untreated effluent water to meet construction dust suppression needs." The total construction water use for 2018 listed in Table 2 above was below the estimated construction water use for this time period as presented in *Appendix T of the 100% BODR*. The estimate in Appendix T of the 100% BODR assumed On-Site water use of 8 gallons per cubic yard of excavation during the 2nd and 3rd quarter of year, the primary construction period during 2018. Actual On-Site water usage during 2018 was 5.3 gal/cy of excavated material. Though water use during previous construction seasons was above estimated water use presented in the BODR, current water use rates show an improvement with the start of mass haul operations.

   It needs to be noted that water used for each cubic yard of material placed is dependent on the haul distance from the waste pile to the pit as a significant amount of dust control water is used for the haul roads. Therefore, the amount of dust control water will need to continue to be evaluated as differing haul distances are used in future years.

   Lignosulfonate was applied to the East Access Road in 2018 to reduce off-Site dust control water use in this area. In addition, DMC/Newmont will continue evaluation of additional dust suppression procedures and other dust suppression materials that may be implemented or used to lessen the water use for dust suppression in 2019 during bulk waste rock hauling.

2. **Waste Volumes**. The second item on Page 1 of Table 5-1 in the RAWP identifies that: "Waste Characteristics - Waste volumes, waste shrink/swell properties, and waste settlement / deformation. Assume 1:1 excavation: backfilled waste volumes."

   Waste Volumes – Excavated volumes for Stockpiles 6 and 7 were greater than the estimated volumes in the Appendix D of the *100% BODR*. Stockpile 6 was located on the South Waste Rock Pile (SWRP) and materials from the bottom of Pit 4 (e.g. sediments and sump excavation soils) and Area 5 had been stockpiled on the stockpile. Additionally, excavation of SWRP material under Stockpile 6 continued as cleanup of Stockpile 6 continued with all material treated as Stockpile 6 (i.e. high activity/high reactivity) material. This overage does not affect the overall material balance for Pit 4 since all material hauled was scheduled for placement in the pit.

   The overage for Stockpile 7 was similar with crusher reject material that had been placed against Stockpile 7 in 2017 being hauled to Pit 4 as part of the Stockpile 7 haul. Both the Stockpile 7 material and the crusher reject material were schedule to be hauled to Pit 4 so the overall material balance for the pit was not affected.

   Shrink Swell – Total bank excavation volumes continued to be measured in 2018. Shrink swell factors between bank excavation volumes and placement volumes in Pit 4 show between 5% and 6% shrinkage between bank and placed volumes. A portion of

this volume may be the relatively loose (unconsolidated) banked condition of materials from the TISS and crusher reject stockpiles.

Bank excavation placed volumes will continue to be measured, and shrink/swell factors will be evaluated as waste placement in Pit 4 progresses.

3.2 POTENTIAL PROBLEMS AND AMP RESPONSE ACTIONS

Critical issues identified during the 2018 construction season are consistent with those reported in 2016 and 2017, these are construction water use/management and the quantity of material to be placed in the pits.

Construction water use continues to be monitored and opportunities for use of additional dust palliatives are being evaluated. Opportunities for reducing construction water use will be part of the planning for future construction activities.

Actual removal volumes of mine-affected materials will continue to be evaluated against the estimated cleanup volumes presented in the BODR. Corrective actions will be dependent on the observed variance between actual and estimated removal volumes.

3.3 RESPONSES TO EPA COMMENTS

EPA comments on the initial version of this document (i.e., *Midnite Mine 2018 Remedial Action Summary Report – Rev 1 (Draft)* dated March 2019*)* are provided in Attachment 4 and the revisions provided to this document (Final – Rev 2) are in response to those comments.

4.0 SUMMARY REPORT SIGNATORIES

The information contained in this summary report is to the best of my knowledge and belief, true, accurate, and complete based on my inquiry of the person or persons who managed the construction work, or those persons directly responsible for gathering the information contained herein.

_____

Project Coordinator – William Lyle

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Supervising Contractor – Louis Miller, PE

_____

Professional Engineer – Jed Thompson

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